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- Description of statistical procedure with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results.

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- (ii) *Chapter in a book* : Ingle JI, Simon JH, Mahtou P. Outcome of endodontic treatment and re-treatment. In: Ingle JI, Bakland LK, editors. Endodontics, 5th ed. Ontario: BC Decker, 2002: P. 747-765.

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Annual Clinical Audit of Indoor, Dhaka Dental College and Hospital (January 2004 - December 2005)

N Uddin¹, MU AHMED², IA Haider³, AKMS Morol⁴

Abstract

Clinical audit of indoor, Dept. of Oral and Maxillofacial Surgery, Dhaka Dental College and Hospital was performed for two years, January 2004 to December 2005. Data included all the indoor patients who were admitted for elective surgery. Day cases were excluded from the study. The audit was performed to assess the nature of pathology and number of patients admitted for surgical treatment.

Key words: clinical audit, number of patients, surgical pathology.

Introduction

Clinical audit signifies many aspects of a hospital, like quality of treatment. Process of management, successful and failure of procedures, comparison between departments, hospitals and countries. The outcome is to improve overall management system of patients. Careful audit and self review outcomes throughout professional career is an essential part of maintaining surgical standards. If accurate records are kept it is not a great burden to produce monthly and annual figures on the activities of the department. Regular audit meeting provide a forum to discuss policy change and encourage a cohesive team approach. These are excellent and essential basis for continuing surgical education of all grades of surgeons ⁴.

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This study focused on oral and maxillofacial pathological conditions and number of patients admitted in Dhaka Dental College and Hospital in two years.

Materials and Methods

A retrospective study was performed in the department of Oral and Maxillofacial Surgery, Dhaka Dental College and Hospital. A total of 139 and 202 admitted patients in 2004 and 2005 respectively were studied. Records of admission, discharge, history sheet, operation and other management notes were studied.

Results

In 2004 and 2005 a total of 139 and 202 patients respectively were admitted in indoor hospital with various pathologies.

Table – 01: Number of admitted patients

Year	Number
2004	139
2005	202
Total	341

Table – 02: Various pathologies

Pathology	2004 (n=139)		2005 (n=202)	
	No.	Percentage	No.	Percentage
Tumor	50	36	73	36
C.L.P	06	4	17	9
Trauma	34	25	62	30
Osteomyelitis, Cellulitis	17	12	22	11
TMJ ankylosis	6	4	8	4
Deformities, Oro-antral fistula, cysts & Others	22	16	16	8
P.O. Complications	4	3	4	2

Though number of patients increased in 2005 than 2004, the percentage of various pathologies was similar. Patients with tumours, benign and malignant were 36%. The second highest patient admission was with facial bone fracture (trauma). In each year, post operative complications was 3% and 2% respectively in two years.

Table – 03: Tumour
(36% of total pathology)

Benign 64%

-Mostly Ameloblastoma

Malignant 36%

-Mostly Squamous cell carcinoma



Most of the malignant tumours were squamous cell carcinoma. For approaching to the floor of the mouth, mandible and associated structures, the standard lip-splitting lower cheek flap incision was usually given. On the basis of extent and spread of tumour composite resection was done with or without reconstruction.

Table – 04: Facial bone fracture

Fracture	2004 (%)	2005 (%)
Mandible	27	37
Maxilla	6	3
Zygomatic bone alone	4	5
Maxilla, Zygomatic bone, nasal bone and others	4	10

(28% of total pathology)



Mandibular fracture due to road-traffic accident was the highest in both the years. Open reduction and internal fixation by titanium mini plate was done in most of the cases.

Table – 05: Cleft-Lip and Palate

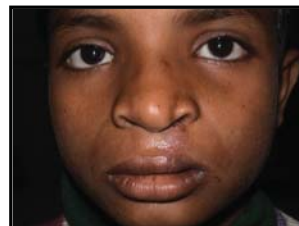
	2004	2005
Unilateral cleft-lip	5	3
Bilateral cleft-lip	2	0
Cleft-lip with plate	1	2

Year	< 3 Years	> 3 Years
2004	3	1
2005	4	2

Adult cleft lip



Pre-operative



Past-operative

For correction of unilateral cleft lip Tennison's triangular flap, for bilateral cleft lip Veau-111 straight line closure was used and for palatal repair Wardill V-Y technique was incorporated into pushback technique.

Discussion

Department of Oral and Maxillofacial Surgery, Dhaka Dental college and Hospital deals with wide range of diseases and surgical procedures from simple one like impacted wisdom tooth to complex and complicated ones like corrective jaw surgery, complex reconstructive surgery, neck dissection for metastatic malignant tumour, cleft lip and palate surgery etc. Pathologies like dentigerous cyst, odontogenic keratocyst or ameloblastoma are routinely managed by simple enucleation of the cyst to resection of the pathology with surrounding healthy bone, sometimes reconstruction plate with or without bone graft. Ameloblastoma was most common type of odontogenic tumour in many studies⁷. In the present study among all benign tumour ameloblastoma was higher in number, the high frequency of ameloblastoma was also consistent with data from Africa^{1,3,6}.

Mandibular fractures are twice as common as fractures of the bones of the midface and comprise most of the traumatic injuries. The main causes of fracture of jaw bones and laceration of facial soft tissue worldwide are common due to road traffic accident and assault. Some studies have shown that assault is more common in developing countries, whereas traffic accidents are more common in developed countries⁵. In our study mandibular fracture was more and most of them were due to RTA. Most often open reduction and internal fixation of the jaw and facial bones were done together with soft tissue repair. Most of the temporomandibular joint ankylosis was managed by bilateral condylectomy and coronoidectomy with inter-positioning of temporalis muscle.

Though adult cleft lip is rare in developed countries, there were a good number of patients in the department who were treated as day-case and excluded from this study but out of 7 admitted patients with cleft palate 3 were adults and most of them were of poor socioeconomic condition. Post operative complications were seen few in number in case of reconstruction for malignant tumour, huge benign lesion, and temporomandibular joint ankylosis surgery.

Complications in reconstruction for bony defects following cancer resection was seen in studies primarily due to compromised vascularity of recipient site, radiation, tissue scarring and potential contamination of the wound with oral flora². A number of 6 and 8 patients attended with TMJ ankylosis in 2004 and 2005 respectively of which most common contributing factor was trauma.

Conclusion

In oral and maxillofacial surgery department most of the time patient attended with complication or in advanced stage, which sometimes made the treatment difficult. Very few patients stated about their attention on the diseases at the early stage. So it is time-demand to start Oral and Maxillofacial pathology screening throughout the country. Increased awareness of citizen about pathologic complication, importance of follow-up after surgery and improved referral system by medical and dental graduates can help in improving service in oral and maxillofacial surgery.

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Loss of First Permanent Molar Teeth in Patients Attending in OPDs of Selected Dental Hospitals in Dhaka City

MJ Sumi¹, J Barua², CM Jan³, KS Imtiaz⁴, I Ahmed⁵, ST Ahmed⁶

Abstract

Tooth loss, especially first permanent molar tooth loss is the ultimate barometer of failure or success in dentistry and dental health programs. A cross-sectional study was conducted among 210 patients attending in outpatient department of selected dental hospitals in Dhaka city to find out the loss of first permanent molar teeth among them. Regarding age (34.8%) of the respondents were below 25 years followed by 25.5% between 25 – 35 years (mean age 33.16 ± 14.10 years). In case of educational status (31%) completed primary education followed by 16.2% were graduates and 33.3% were illiterates. Majority (59.5%) of the respondents had monthly family income below 5000 BDT (mean income 6802.39 ± 6630.39 BDT). Among the respondents, 33.8% knew brushing technique and 79.5% of them brushed once in a day. Majority (68.5%) of them used tooth paste for brushing and tooth brush was used by 67.1% of the respondents. In case of first permanent molar tooth missing, 50% missed lower left, 19.6% lower right, 17.4% upper left and 13% upper right. Among the respondents, 86% teeth loss was due to caries followed by periodontal disease (12.4%) and orthodontic reason (5.2%). Among the respondents who lost tooth, 55.7% were below 15 years followed by 15 - 30 years (34.3%) and above 30 years (10%). Regarding oral hygiene status, 19% had satisfactory and 81% had unsatisfactory oral hygiene. So it can be concluded that loss of permanent first molars can be avoided if good preventive measures are used before these teeth erupt and are continued after they have erupted in addition to maintaining proper oral hygiene. Further large scale study regarding this topic is recommended.

Keywords: molar teeth, tooth loss.

Introduction

Tooth loss is the ultimate barometer of failure or success in dentistry and dental health programs. Despite significant improvements in oral health, tooth loss remains a dental public health problem among children & adults.

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Tooth loss especially first permanent molar tooth loss is a terminal event in the life of a tooth and is a frequent episode in individuals with uncared and neglected oral cavity¹. First permanent molars are the most important teeth, with a key role in occlusion. First permanent molar erupts at the age of 6 to 7 years and hence is also known as “six year molar”². Tooth loss can be verified in developed countries in the last years which can be explained by preventive programs and higher accessibility to the oral health care that has been decreasing the tooth loss but the scenario is totally opposite in developing countries³.

The epidemiology in dentistry has showed that dental caries and periodontal diseases are the most prevalent pathologies that affect the oral cavity⁴. In Bangladesh, where treatment facilities are very limited, poor oral health has turned into a big medical and social problem. The practices of quack and the use of many indigenous methods to get relief from diseases also place them at high risk of complications. The overall influence of oro-dental disease upon the whole community is very severe and cannot be overlooked as it plays an adverse role on general health⁵.

The people of low income group in Bangladesh come to the government health complexes and hospitals for the treatment of dental pain. The dental patients cannot think about retention of tooth and thus tooth extraction is the most common treatment for dental pain relief⁶.

Molar teeth are very important for occlusal stability and chewing food. These teeth are important in chewing and maintaining the vertical dimension. Due to anatomical structure first permanent molar is more prone to oral diseases.⁷

A study done in Israel on a sample of elderly patients where periodontitis was the main reason for tooth loss, the incisors and molars were the teeth most commonly extracted, the upper premolars were the teeth most frequently extracted due to caries.⁸ First permanent Molar tooth loss indicates the unconcern for oral health care, which is a serious health problem. There may be several causes behind this problem, in order to take preventive measures against this problem, the causes should be detected.

Materials and Methods

This cross-sectional study was conducted in Bangladesh Dental College Hospital and Shaheed Suhrawardy Medical College Hospital (Dental Unit) at Dhaka city of Bangladesh, among 210 selected patients with at least one first permanent molar tooth loss who attended at the outdoor dental department during January to April 2014. Data were collected using an interviewer structured and semi-structured questionnaire. Clinical examination was also done by dental mirror and periodontal probe.

Results

Table 01: Distribution of the respondents by socio-demographic characteristics (n=210)

Socio-demographic characteristics	Frequency	Percentage
Age Group		
Below 25 Years	73	34.8
25 - 35 Years	54	25.7
35 - 45 Years	39	18.6
Above 45 Years	44	21.0
Sex		
Male	110	52.4
Female	100	47.6
Level of education		
Illiterate	70	33.3
Primary	65	31.0
Secondary	26	12.4
Higher Secondary	15	7.1
Graduation	34	16.2
Monthly family income		
Below 5000 BDT	125	59.5
5000 - 15000 BDT	73	34.8
Above 15000 BDT	12	5.7

The 'table 01' shows that among the respondents, 73 (34.8%) were in the age group below 25 years, followed by 54 (25.7%) in the age group 25 – 35 years, 44 (21%) in the age group above 45 years and 39 (18.6%) were in the age group 35 – 45 years (mean 33.16 ± 14.10 years). Among the respondents 110 (52.4%) were male and 100 (47.6%) were female. Among the respondents, 70 (33.3%) were illiterates, 65 (31%) had primary education, 34 (16.2%) had graduation, 26 (12.4%) had secondary level of education, 15 (7.1%) completed higher secondary level of education. The monthly family income of 125 (59.5%) families were below 5000 BDT, followed by 73 (34.8%) were monthly income 5000 – 10000 BDT and 12 (5.7%) had monthly income above 15000 BDT (mean 6802.39 ± 6630.39 BDT).

Table 02: Distribution of the respondents by brushing patterns (n=210)

Brushing patterns	Frequency	Percentage
Technique of brushing		
Yes	71	33.8
No	139	66.2
Brush in a day		
Once	167	79.5
Twice	43	20.5
Materials used for brushing		
Tooth paste	144	68.6
Tooth powder	34	16.2
Charcoal	32	15.2
Used for cleaning teeth		
Tooth brush	141	67.1
Meshwak	19	9.0
Finger	50	23.8

The 'table 02' shows that among the respondents, 71 (33.8%) knew the brushing technique and 139 (66.2%) did not. Among the respondents, 167 (79.5%) brushed once and 43 (20.5%) brushed twice in a day. Materials used for brushing, 144 (68.6%) used tooth paste, 34 (16.2%) used tooth powder and 32 (15.2%) used charcoal, 141 (67.1%) used tooth brush, 50 (23.8%) used finger and 19 (9%) used meshwak for cleaning teeth.

Table 03: Distribution of the respondents by first permanent molar missing tooth (n=210)

Missing tooth	Frequency	Percentage
Upper right first permanent molar	30	14.3
Upper left first permanent molar	39	18.6
Lower right first permanent molar	41	19.5
Lower left first permanent molar	100	47.6

The 'table 03' shows that among the respondents first permanent molar tooth missing, 100 (47.6%) had lower left first permanent molar missing, 41 (19.5%) had lower right first permanent molar missing, 39 (18.6%) had upper left first permanent molar missing and 30 (14.3%) had upper right first permanent molar missing.

Table 04: Distribution of the respondents by reasons of teeth loss (n=210)

Reason	Frequency	Percentage
Caries	173	82.4
Periodontal disease	26	12.4
Orthodontic reason	11	5.2

The 'table 04' shows that among the respondents reasons of teeth loss, 173 (82.4%) were caries, 26 (12.4%) were periodontal diseases and 11 (5.2%) were orthodontic reasons.

Table 05: Distribution of the respondents by age of tooth loss (n=210)

Tooth Loss	Frequency	Percentage
Below 15 Years	117	55.7
15 - 30 Years	72	34.3
Above 30 Years	21	10.0

$$\text{Mean} = 18.32 \pm 9.72 \text{ Years}$$

The 'table 05' shows that among the respondents who had tooth loss, 117 (55.7%) were below 15 years followed by 72 (34.3%) were 15 – 30 years and 21 (10%) were above 30 years. The mean years were 18.32 ± 9.72 years.

Oral hygiene status

■ Satisfactory ■ Un-Satisfactory

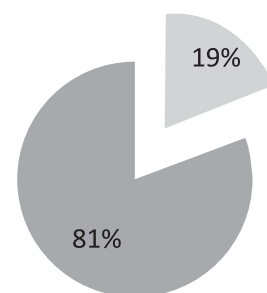


Figure 01: Distribution of the respondents by oral hygiene status (n=210)

The 'figure 01' shows the oral hygiene status, 40 (19%) had satisfactory and 170(81%) had unsatisfactory oral hygiene status.

Discussion

Tooth loss is the ultimate barometer of failure or success in dentistry and dental health programs. This cross-sectional study was carried out to find out the loss of first permanent molar teeth in patients attending in outpatient department of selected hospitals of Dhaka City. Above one-third were in the age group below 25 years, followed by one-fourth were in the age group 25 – 35 years, above one-fifth were in the age group above 45 years, around one-fifth were in the age group 35 – 45 years (mean age 33.16 ± 14.10 years) and above half of them were male. Regarding level of education above one-third had primary followed by below one-fifth graduation, about thirty five per cent were illiterates. Among the respondents monthly family income depending upon the time of tooth loss, around sixty per cent had monthly income below 5000 BDT, followed by below thirty five per cent had monthly income between 5000 – 10000 BDT and five per cent had monthly income above 15000 BDT (mean monthly income 6802.39 ± 6630.39 BDT).

The study also revealed that among the respondents brushing patterns, above one-third knew the brushing techniques and around eighty per cent brushed once daily. Among the respondents above sixty five per cent used tooth paste for cleaning teeth followed by sixteen per cent used tooth powder and one-seventh used charcoal.

The study shows that among the respondents above sixty five per cent used tooth brushes for cleaning teeth; twenty four per cent used finger and nine per cent used meshwak.

The present study shows that among the respondents first permanent molar tooth missing, around half of them were in lower left, below one-fifth were in lower right, less than twenty percent were in upper left and fourteen per cent were in upper right. A Romanian study shows that percentage of children and adolescents had 5.2% permanent first molars⁹. The study revealed that among the respondents reasons of teeth loss above eighty five per cent were caries, twelve per cent were periodontal diseases and five per cent were orthodontic reasons. A Greek study shows that (36.4%) were extracted because of periodontal reasons¹⁰, 24.5% for dental caries and 31.1% for other reasons such as dental caries and periodontal diseases, root trauma, vertical fracture of root/crown, orthodontic reasons and a Sudanese studies found that prevalence of tooth loss (missing at least one tooth) was 78%; 66.9% of tooth loss was due to caries, and 11.2% was attributable to other reasons¹¹.

Among the respondents tooth loss above half of them were below 15 years followed by less than thirty five per cent were 15 – 30 years and one-tenth were above 30 years (mean age was 18.32 ± 9.72 years). The study also revealed that among the respondents oral hygiene status below one-fifth was satisfactory, above eighty per cent was unsatisfactory.

Conclusion and Recommendations

The study concluded that among the respondents around thirty five per cent were below 25 years age group and above half of them were male. The study found that most of the (82.4%) respondents tooth loss was due to caries and above half of the respondents tooth loss was in the age below 15 years. The study also revealed that among the respondents oral hygiene status, above eighty per cent were un-satisfactory and below one-fifth was satisfactory. Based on the key findings of the present study, the following recommendations are made: The loss of first permanent molars can be avoided if good preventive measures are initiated after they have erupted, some school based awareness programs including parents, teachers and students can be helpful. It will be more beneficial if mass media start some programs about this matter and further large scale study regarding this topic is recommended.

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Assessment of Oral Hygiene Status and Attitude of Dental Students Towards Periodontal Care: An Introspective Mirror

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Abstract

Dental students represent the educated, urbanized, influential and motivated class of individuals. If motivated for oral health, they can transfer the same knowledge and behavior patterns to patients during their practices. With this intention, this study was planned. 200 dental students were assessed by a close-ended, four-item questionnaire. Oral hygiene was assessed by Simplified Oral Hygiene Index (OHI, Greene and Vermilion, 1964) and gingival condition by Gingival Index (GI, Loe & Silness, 1963). A positive change in attitude was observed from first to final year students. 100% of them used tooth brush and paste, but 88%, 88% 96%, 92% in first, second, third and fourth year cleaned their tongue; whereas 70%, 92%, 94%, 92% of them, respectively, were in favor of scientific method of brushing. 92%, 90%, 96%, 100%, respectively, felt visiting the dentist during gingival bleeding. Also, there was statistically significant improvement in GI between first and final year ($p=0.00005$), between second and final year ($p=0.0003$) students. OHI showed a consistent improvement from first to final year ($p<0.05$). A positive change in attitude with reduction in GI and OHI status was observed with the increase in professional years.

Key message: The attitude towards periodontal care is quite unsubstantial and oral hygiene status, gingival condition among first and second year dental students is poor as compared to third year and final year students. So, there is need to bring about a change in the attitude and improvement in oral hygiene status and gingival condition of dental students from their initial years of learning.

Keywords: Attitude, dental students, oral hygiene status, periodontal care, questionnaire.

Introduction

Dental professionals play a vital role in the motivation and improvement of oral health education of people.

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Therefore, acquiring knowledge and attitude related to dental health and the prevention of oral diseases is very important during the future dentist's training period.¹ One of the main objectives of dental education is to train students who can motivate patients to adopt good oral hygiene.² They are more likely to be able to do this if they themselves are motivated. Moreover, dental students should be able to apply this knowledge and attitude for their own dental care.³

The prevention of oral and periodontal diseases is the most accepted and efficient method for ensuring oral health.⁴ Oral health is now recognized to be equally important in relation to general health.⁵ The behavior of oral health care providers and their attitudes towards their own oral health reflect not only their understanding of the importance of preventive dental procedures but also helps in improving the oral health of their patients.⁶ Researchers have found that oral hygiene practices among dental students are different by years of study in dental school.⁷

Various studies have been conducted in different countries to evaluate the changes in attitude and oral hygiene status in dental students. The study carried out to assess dental attitudes and behavior among dental students in Jordan reported that the oral health attitude and behavior in Jordan were poor⁷.

Kawamura et al. reported that significant cultural differences in oral health attitudes, behaviors and values were found in the freshman dental students from Japan, Hong Kong and Western China.⁸

Another study that explored the cross-cultural differences in the self-reported oral health behavior between Greek and Japanese dental students concluded that there were considerable differences in dental health attitudes/behaviors between the students in the two countries, reflecting the different cultures and the health education systems.⁹

However, a few studies have been conducted in India regarding this issue. So a cross sectional survey and oral examination was designed and conducted at one institute in Moradabad, India, to investigate and evaluate the oral hygiene status and change in attitude of dental students towards periodontal diseases.

Materials and Methods

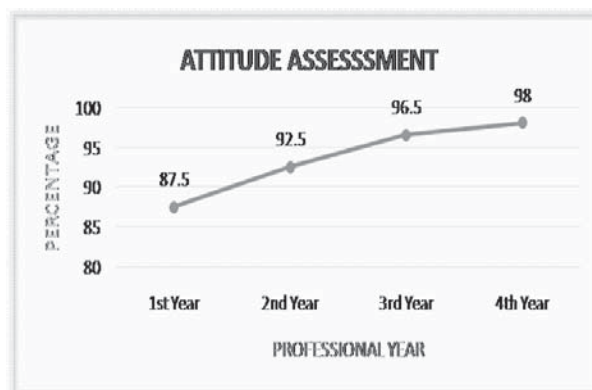
A cross-sectional study by oral examination was conducted among dental students of Kothiwal Dental College and Research Centre, Moradabad, U.P, India to assess their oral hygiene status and attitude regarding periodontal diseases from 4th January 2014 to 31st March, 2014. Ethical approval from the authority and written consents were obtained from the participating subjects. A total of 200 dental students, 50 each from first year to fourth year were interviewed through a self-administered questionnaire containing 4 closed ended items (Table-1)^{10,11} and their oral hygiene status was examined. The respondents were instructed to fill the questionnaire without discussing with each other in their own classroom.

Oral hygiene status was assessed by Simplified Oral Hygiene Index (OHI, Greene and Vermilion, 1964). Gingival condition was evaluated by Gingival Index (GI, Loe & Silness, 1963). The responses and findings were compiled, computed and analyzed.

Results

Overall, the percentage of students who gave positive answers were found to be 87.5% among first year dental students, 92.5% for second year, 96.5% for third year and 98% for fourth year dental students (Graph-1). Also, there was an improvement in OHI status and GI, the difference for GI being statistically significant between first year and final year and between second year and final year dental students. OHI showed a consistent statistical improvement from first year to final year.

Graph-01: Overall percentage of students who gave positive responses



Question no.1: The first question was to assess the attitude of dental students towards oral hygiene aids like tooth brush and paste for cleaning the teeth. 100% of all the 1st year, second year, third year and final year dental students used tooth brush and tooth paste for cleaning their teeth.

In Question no.2: When asked about any scientific method of brushing, 70%, 92%, 94% and 92% of dental students from first, second, third and fourth year, respectively said "Yes".

In Question no.3: 88% of first year, 88% of second year, 96% of third year and 92% of final year dental students said that they clean their tongue.

In Question no.4: When they were asked if there is a need to visit the dentist when there is bleeding from the gums, 92% of first year, 90% of second year, 96% of third year and 100% of final year dental students felt the need.

The detailed questionnaire and responses of the dental students in percentage from first year to final year has been depicted in Table-2.

Table-02: Illustration of percentage of responses of questionnaire

Questions	Question Type	1 st Year (%)	2 nd Year (%)	3 rd Year (%)	4 th /Final Year (%)	Total (%)
How do you clean your teeth?	Tooth brush and tooth paste	100	100	100	100	100
	Any other	0	0	0	0	0
Do you think that there can be any scientific method of brushing?	YES	70	92	94	92	87
	NO	30	8	6	8	13
Do you clean your tongue?	YES	88	88	96	92	91
	NO	12	12	4	8	9
Do you think there is a need to visit the dentist when there is bleeding from the gums?	YES	92	90	96	100	94.5

Oral hygiene status and gingival condition evaluation showed that with advancing professional status (1st year to 4th year) a significant decrease in GI and OHI status was observed (Graph-2) which was also significant statistically ($p < 0.001$).

Also, there was an improvement in oral hygiene status and gingival index, the difference for gingival index being statistically significant between first year and final year and between second year and final year dental students. Oral hygiene index showed a consistent statistical improvement from first year to final year (Graph-2) (Table-3).

Graph-02: Mean Values of GI and OHI

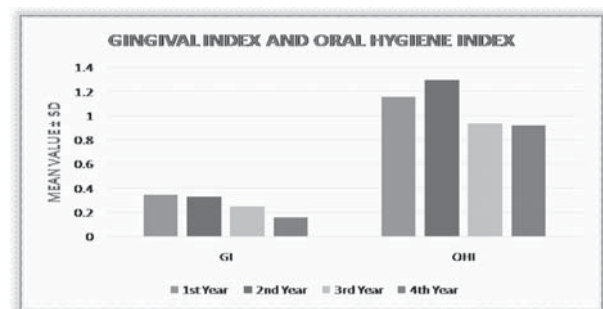


Table-03: Illustration of GI and OHI in dental students

		n	Mean	Std. Deviation	Minimum	Maximum
GI	1st year	50	0.3487	0.23977	0.00	1.08
	2nd year	50	0.3301	0.22721	0.07	1.12
	3rd year	50	0.2502	0.20251	0.00	1.19
	4th year	50	0.1675	0.09853	0.00	0.46
	Total	200	0.2741	0.21105	0.00	1.19
F=8.609; p=0.0000213970						
OHI	1st year	50	1.1547	0.36448	0.00	2.00
	2nd year	50	1.3104	0.25919	0.92	1.91
	3rd year	50	0.9430	0.33852	0.00	1.54
	4th year	50	0.9281	0.29170	0.00	1.46
	Total	200	1.0841	0.35164	0.00	2.00
F=16.749; p=9.9923135585751x10 ⁻¹⁰						

A moderate correlation between OHI and GI was observed which was also significant statistically (Graph-3). Strong correlation between OHI and GI was observed in 2nd professional students. For all the other professionals, the correlation was moderate (Table-4).

Graph-03: Correlation between GI and OHI

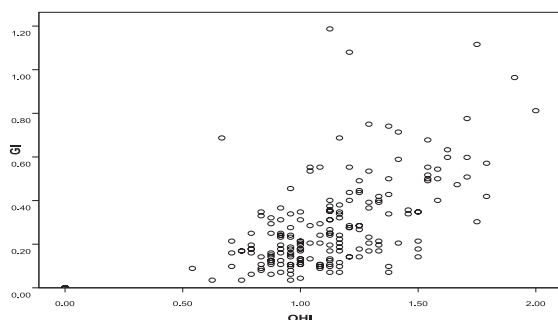


Table-04: Correlations between GI and OHI

1 st year	Pearson Correlation Sig. (2-tailed)	.539(**) 5.37x10 ⁻⁵
2 nd year	Pearson Correlation Sig. (2-tailed)	.713(**) 6.35x10 ⁻⁹
3 rd year	Pearson Correlation Sig. (2-tailed)	.533(**) 6.78x10 ⁻⁵
4 th /Final year	Pearson Correlation Sig. (2-tailed)	.570(**) 1.53x10 ⁻⁵

Discussion

It has been observed that oral hygiene has mostly remained as an ignored and unrealized major social problem. Majority of the people including dental professionals, themselves are unaware about the relationship between oral hygiene and systemic diseases or disorders.

Most diseases show their first appearance through oral signs and symptoms and they remain undiagnosed or untreated because of this missing awareness and neglected attitude towards periodontal care.¹¹

By virtue of their profession, dental professionals and students play a pivotal role in health promotion and dissemination of preventive information, oral hygiene practices, positive attitude among their patients, family and society. It is therefore important that their own health knowledge is good and their oral health behavior conforms to the expectation of the population. Therefore, a study was conducted to assess their oral hygiene status and attitude regarding periodontal diseases.

The questionnaire for the study consisted of questions related to oral hygiene practices for judging their attitude towards periodontal care and maintenance, for example - cleaning the teeth, tongue, any scientific method of brushing, need to visit the dentist when there is bleeding from gums.

Oral hygiene is the practice of keeping the mouth healthy and clean by brushing and flossing to prevent tooth decay and gum diseases. It can be maintained only when an individual has a positive attitude towards his own periodontal care. So, when the dental students were asked regarding the cleaning of teeth, 100% of them responded that they cleaned their teeth with tooth brush and tooth paste, this finding attributes to the positive attitude of these students regarding maintenance of periodontal care and oral hygiene because of increased knowledge and awareness regarding this aspect. This was contradictory to the consumer usage and attitudes study done in 2010, where, one of the most shocking finding was that nearly half of the Indian population did not use a tooth brush and only 51% brushed their teeth using a tooth brush and toothpaste.¹²

When interrogated whether they cleaned their tongue and whether there is a scientific method of brushing, less percentage of students used in first year (88%, 70% respectively), however, this percentage increased in second year (88%, 92% respectively) probably because their knowledge regarding maintaining oral hygiene increased through their seniors and interaction with their teachers.

In the third year, percentage increased (96%, 94% respectively) as their basic knowledge further increased as basic course in clinical periodontology started in the third year and they were taught in detail about dental plaque and methods of plaque control.

Surprisingly, in final year, less percentage of students (92%, 92% respectively) cleaned their tongue, and were less ledgeable in scientific method of brushing as compared to third year. Mostehy *et. al.*,¹³ reported the absence of an improvement in oral hygiene practices of dental students regardless of having obtained information and education. However, this finding needs to be evaluated in a large sample size.

When the students were asked about the need to visit the dentist when there is bleeding from gums, less percentage of second year students (90%) felt the need than the first year (92%). However, third year (96%) and final year (100%) students' attitude changed and became more assertive by observing their seniors, staff treating cases and by reading periodontology books.

It is expected that the students might have the basic interest or knowledge about oral hygiene and periodontal maintenance and they practice it well in daily life before entering the course, simultaneously, their oral hygiene status should also improve from first year to final year. So, their oral hygiene status was assessed by Simplified Oral Hygiene Index (OHI, Greene and Vermilion, 1964). Gingival condition was evaluated by Gingival Index (GI, Loe & Silness, 1963).

There was an improvement in OHI status and GI (Graph-2), the difference for GI was statistically significant between first and final year ($p=0.00005$) and between second and final year ($p=0.0003$) dental students, insignificant finding between first and second year (p value= 0.9666), first and third year (p value= 0.0691), second and third year (p value= 0.1924), third and final year (p value= 0.1664). The decrease in GI values with mean of 0.3487, 0.3301, 0.2502, 0.1675 from first, second, third and fourth year, respectively may be due to prior admission in dentistry, evaluation of attitude and oral hygiene status in first year gives an idea of the level of understanding and perception of society towards oral hygiene and periodontal care,

OHI showed a consistent improvement from first year to final year, that was significant between first and third year ($p=0.005$), first and final year ($p=0.002$), second and third year ($p=0.0000001$), second and final year ($p=0.00000004$), third and first year ($p=0.002$). Insignificant finding (p value= 0.0690) was observed between first year and second year ($p=0.0690$) and third year and final year ($p=0.9953$) students. Thus, OHI status showed a significant decrease from first year to final year, as during first and second year, students are unaware of various oral hygiene practices, methods and etiology for periodontal diseases that is poor oral hygiene i.e. plaque and calculus as it is not included in their curriculum, but as they reached third year and final year, their basic knowledge further increases by the virtue of their clinical postings and also as the basic course in clinical periodontology starts in the third year and they are taught in detail about dental plaque, its control by various tooth brushing methods and role in causing periodontal diseases.

A moderate significant correlation between oral hygiene index and gingival index was observed (Table-3) (Graph-3) that clearly signified that poor oral hygiene was responsible for gingival inflammation, implicating the vital role of dental plaque in causing gingival inflammation and therefore, leading to periodontal diseases.

A strong correlation between OHI and GI was observed in 2nd professional students. This may be due to few students in second year with poor oral hygiene and gingival status, that has led to these negative findings in second year.

Further studies are required to include more students at multiple professional institutes to evaluate the oral hygiene status and attitude towards periodontal care among the budding dentists. These findings may be utilized to improve the courses of studies and policy-making in the Dental Councils.

Conclusion

This study presented a comprehensive overview of oral hygiene status and the attitude towards periodontal care among dental students. It can be concluded that there is change in attitude and reduction in gingival index and oral hygiene index status with the progress in professional year i.e. from first year to final year students.

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Prophylactic use of cephadrine in dental procedures: A observational study in Bangladesh

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Abstract

Bacteremia is common with manipulation of the teeth and periodontal tissues during dental procedures. Majority of dental office visits result in some degree of bacteremia that warrants antibiotic prophylaxis before a dental procedure to reduce the frequency, nature or duration of bacteremia. This study aimed to collect data on prophylactic use of cephadrine which is most preferred in dental procedures in Bangladesh. A total of 2219 patients both adults and children above 5 years were enrolled to assess use of antibiotic, its dose and duration for antibiotic prophylaxis during dental procedures. Efficacy of antibiotic prophylaxis in terms of clinical cure, further dose modification and need to change antibiotic was evaluated at day 10 of antibiotic use and in case of root canal therapy at day 30. Any side effect of antibiotic use recorded within 3 days was considered for safety evaluation. This was a non-controlled, multicentre, observational study. 2016 (90.9%) of the patients received cephadrine as prophylactic antibiotic with a mean dosage of 500mg (487.48+60.99) and duration of treatment was 3-7 days (5.47+1.03). Some of the dentists also preferred amoxicillin (149, 6.7%) and cephalexin (54, 2.4%) for prophylaxis. The majority of the patients (1657, 82.2%) who had prophylaxis with cephadrine had no clinical sign of infection and some of the patients needed to change their initial dose or change of the antibiotic. Overall 1816 (81.8%) patients were found having no clinical sign of infection on antibiotic prophylaxis. Among the patients 239 (10.7%) needed to change the dose of prescribed antibiotic and 55 (2.4%) were required to change their prescribed antibiotic. However, the data on type of infection was not recorded. 109 (4.9%) patients were lost to follow up on Day 10. Prescribed antibiotic prophylaxis was not associated with adverse events in majority (91%) of the patients. Some of the patients reported diarrhea (104, 4.7%), stomach upset (68, 3.1%) and dizziness (31, 1.4%) during antibiotic use. However, those were self-limiting and no dose adjustment, discontinuation of therapy or withdrawal from the study was required. No serious adverse events were reported. Cephadrine 500 mg for 5 days course was preferred as prophylactic antibiotic in dental procedures in this study. Majority of the patients had no clinical sign of infection on evaluation at day 10. Cephadrine therapy was mostly not associated with adverse events in patients; however, diarrhea, stomach upset and dizziness were reported in some patients that were self-limiting.

Keywords: antibiotic prophylaxis, cephadrine dental treatment.

Introduction

Transient bacteremia is common with manipulation of the teeth and periodontal tissues, and there is wide variation in reported frequencies of bacteremia in patients resulting from dental procedures:

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tooth extraction (10-100 percent), periodontal surgery (36-88 percent), scaling and root planning (8-80 percent), teeth cleaning (up to 40 percent), rubber dam matrix/wedge placement (9-32 percent) and endodontic procedures (up to 20 percent).¹⁻⁷ Studies suggest that more than 700 species of bacteria, including aerobic and anaerobic gram-positive and gram-negative microorganisms, may be identified in the human mouth, particularly on the teeth and in the gingival crevices.^{1,8-11} Approximately 30 percent of the flora of the gingival crevice is streptococci, predominantly of the viridans group. Streptococcus viridans, staphylococcus aureus, enterococcus, pseudomonas, serratia, and candida are some of the microorganisms implicated with Infective endocarditis (IE). IE is an uncommon but life-threatening complication resulting from bacteremia. The vast majority of cases of IE caused by oral microflora can even result from bacteremia associated with routine daily activities such as tooth brushing, flossing, and chewing other than dental procedures.^{12, 13}

Because the published data suggest that the vast majority of dental office visits result in some degree of bacteremia, studies reported that antibiotic prophylaxis before a dental procedure reduced the frequency, nature or duration of bacteremia.^{14,15,16} The American Dental Association (ADA), The American Heart Association (AHA) recommended protocols for antibiotic prophylaxis against bacterial endocarditis. The ADA/AHA/AAOS (American Academy of Orthopaedic Surgeons) recommended cephalexin, cephradine or amoxicillin for prophylactic use in dental procedure.¹³ Cephradine is effective against many gram-positive bacilli and cocci (other than enterococcus) and some gram-negative bacilli. It has peak tissue concentrations within the first hour after administration and effective concentrations are maintained for at least 5 hours.

At present there is no consensus regarding prophylactic use of antibiotics in dental procedures in Bangladesh and the reference regimens are varying. Clinical experience from dentists demonstrated that for prophylaxis cephradine was used as choice of antibiotic in 60% of cases during dental procedures. Therefore this observational study was conducted to collect, analyze and disseminate data on prophylactic use of cephradine in dental procedures locally. Another purpose was to find out the guideline or reference if any followed by the physicians during and immediately after the dental procedure in order to reduce the occurrence of bacterial endocarditis, bacterial arthritis, and other soft tissue infection. Moreover the study findings might help to develop a local guidance.

Objectives

Primary objective of the study was to assess the prophylactic use of cephradine in dental procedures. Secondary objectives were to evaluate the clinical cure rate with cephradine prophylaxis in dental procedures and also to find out the guideline or reference if any followed by the physicians during and immediately after the dental procedure in order to reduce infections.

Materials and methods

Adults and children of 5 years and above visiting dentist's office for whom dental procedure having a risk of bleeding or producing high levels of bacteria in blood e.g. Root Canal Therapy (RCT), dental extraction, periodontal surgery and periodontal scaling was planned and antibiotic prophylaxis with cephradine was prescribed were included in this study. Patients required dental procedures but having infection prior to surgical intervention and those had severe medical conditions e.g.

complicated heart disease, uncontrolled diabetes, carcinoma etc. were excluded to participate in this study. Patients with very severe infection who required hospitalization were also excluded from this study.

Methods

This non-controlled, multicenter, observational study was carried out between September 2011 and October 2012 by 31 dentists to assess the prophylactic use of cephradine in dental procedures at their office. Though initially 40 dentists were planned and invited to participate in this study 9 dentists did not enroll patients and were excluded from the study.

Patient demographics, dental examination, investigations, treatment plan, related diseases or risk factors, antibiotic prescribed for prophylaxis with its dose and duration of therapy, any guideline followed by the investigators were collected at baseline. Follow-up data of clinical outcome in terms of clinical cure (in those with previous infection), dose modification of cephradine or change of antibiotic was recorded after 10 days of prophylactic therapy. In case of root canal therapy patient follow-up was continued till 30 days of prophylaxis. Any adverse event reported by the patient within 3 days of therapy was recorded by the investigators. Patient data were collected by the investigators using paper copy of Data Collection Forms (DCF) provided for each patient. The completed DCFs were collected from the investigators by the study monitor at the end of study.

Primary endpoints of this study was to assess demographics, indications, risk factors/ co-morbidities, dosage and duration of antibiotic use in patients who were prescribed cephradine for prophylaxis in dental procedures. Secondary endpoints evaluation aimed percentage of patients who would be clinically cured or needed dose modification or change of antibiotic within 10 days or 30 days in case of specific procedure such as Root Canal Therapy. Percentage of patients who reported side effects within three days was considered for safety evaluation.

All the patients enrolled were considered for primary endpoint analysis and data of the patients available at day 10 of antibiotic use was considered for evaluation of efficacy of antibiotic prophylaxis. Statistical analysis was done using SPSS 17.0 and was mainly descriptive and was summarized as mean, median, standard deviation, minimum, maximum and percentages.

Results

A total of 2219 patients had antibiotic prophylaxis with cephadrine for dental procedures were included in this study. Among the enrolled patients 1180 (53.2%) were males and 1039 (46.8%) were females. The median age of the patients was 35 years, the youngest one 5 years and the oldest one 88 years. There were 234 (10.5%) children (<18 years) and 1985 (89.5%) adults in this study. Majority of the patients (90.6%) were urban residents, 8.7% of the patients were from rural areas and a very few (0.7%) represented from slum areas. About half (47.9%) of the adult patients completed graduation or even higher education whereas 143 (7.2%) of them did not have any educational background. Among the adults 1732 (87.3%) were employed in different professions and the rest were unemployed.

Table 01: Patients characteristics at baseline

	Children (<18 years) (n=234)	Adults (≥18 years) (n=1985)	Total (n=2219)
Age (years)			
Median	9	37	35
Gender			
Male/Female	113/121	1067/981	1180/1039
Locality [n (%)]			
Urban	220 (94.0)	1791 (90.2)	2011 (9.6)
Rural	13 (5.6)	179 (9.0)	192 (8.7)
Slum	1 (0.4)	15 (0.8)	16 (0.7)
Dental examination status			
Gingivitis	54 (23.1)	1069 (53.9)	1123 (50.6)
Periodontitis			
- Mild (<3mm)	50 (21.4)	539 (27.2)	589 (26.5)
- Moderate (3-5mm)	12 (5.1)	457 (23.0)	469 (21.1)
- Severe (>5mm)	0	78 (3.9)	78 (3.5)
Gum recession	8 (3.4)	612 (30.8)	620 (27.9)
Decayed teeth	165 (70.5)	1538 (77.5)	1703 (76.7)
Missing teeth	27 (11.5)	663 (33.4)	690 (31.1)
Filling teeth	44 (18.8)	692 (34.9)	736 (33.2)
Ulcer/white lesion			
- Tongue	1 (0.4)	50 (2.5)	51 (2.3)
- Oral cavity floor	0	33 (1.7)	33 (1.5)
- Palate	1 (0.4)	30 (1.5)	31 (1.4)
- Gingival mucosa	0	63 (3.2)	63 (2.8)
Investigations			
CBC	5 (2.1)	67 (3.4)	72 (3.2)
Xray	50 (21.4)	754 (38.0)	804 (36.2)
Others	0	4(0.2)	4 (0.2)

Among the adult males 364 (18.3%) were habituated with smoking cigarettes and 195 (9.8%) were used to with chewable smokeless tobacco like betel leaf with jarda and gul. The demographic and clinical characteristics of study patients are presented in Table 01. Among the patients 214 (10.8%) of the adults had diabetes mellitus and 86 (4.3%) had history of cardiovascular diseases. A small portion of them also had history of rheumatoid arthritis (0.8%), prosthetic heart valves (0.6%), and drug-induced immunosuppression medical conditions (0.2%). On dental examination, periodontitis was found in 51.1% of patients, gingivitis in 50.65 % and gum recession in 27.9% of patients. Decayed teeth were found in 76.7% of patients, 33.2% had filling teeth and 31.1% had missing teeth. 91 (4.1%) patients had ulcer or white lesion on their tongue, floor of the mouth, palate or gingival mucosa.

Root canal therapy (54%), scaling (52.2%), tooth extraction (36.1%) and dental filling were the most common dental procedures done by the investigators. Other procedures like deep curettage, polishing, root planning and flap, gingivectomy, apicectomy and cyst or any kind of operation were also done in some cases. Table 02 shows detail of the dental procedures advised for the patients.

Table 02: Dental procedures planned for the patients

	Children (<18 years)	Adults (≥18 years)	Total
Scaling	57 (24.4)	1101 (55.5)	1158 (52.2)
Deep curettage	13 (5.6)	260 (13.1)	273 (12.3)
Gingivectomy	8 (3.4)	22 (1.1)	30 (1.4)
Polishing	6 (2.6)	135 (6.8)	141 (6.4)
Root planning & Flap surgery	2 (0.9)	48 (2.4)	50 (2.3)
Tooth extraction	74 (31.6)	727 (36.6)	801(36.1)
Apicectomy	4 (1.7)	19 (1.0)	23 (1.0)
Root canal therapy	100 (42.7)	1099 (55.4)	1199 (54.0)
Filling			
Anterior	8 (3.4)	99 (5.0)	107 (4.8)
Posterior	47 (20.1)	389 (19.6)	436 (19.6)
Cyst or any kind of operation	2 (0.9)	20 (1.0)	22 (1.0)

During dental procedures the investigators prescribed cephadrine (Sefrad®) per oral to 2016 (90.9%) patients as prophylactic antibiotic with a mean dosage of 500mg (487.48 ± 60.99) and duration of treatment was 3-7 days (5.47 ± 1.03). Cephadrine prophylaxis was prescribed to 86.3% (202) of the children and 91.3% (1814) of the adults. For prophylaxis the dentists also prescribed amoxicillin to 149 (6.7%) patients and cephalixin to 54 (2.4%) patients. Table 03 shows antibiotic prophylaxis in children and adults. The investigators followed either text book, international or local guidelines in 318 (14.3%) cases, as reference in prescribing prophylactics.

Table 03: Antibiotic prophylaxis in patients

Antibiotic	Children (n = 234)	Adults (n=1985)	Total (n=2219)
Cephadrine	202 (86.3)	1814 (91.3)	2016 (90.9)
Cephalexin	2 (0.8)	52 (2.6)	54 (2.4)
Amoxicillin	30 (12.8)	119 (5.9)	149 (6.7)

The majority of the patients (1657, 82.2%) who had prophylaxis with cephadrine had no clinical sign of infection and some of the patients needed to change their initial dose or change of the antibiotic. Overall 1816 (81.8%) patients were found having no clinical sign of infection on antibiotic prophylaxis. Among the patients 239 (10.7%) needed to change the dose of prescribed antibiotic and 55 (2.4%) were required to change their prescribed antibiotic. However, the data on type of infection was not recorded. 109 (4.9%) patients were lost to follow up on Day 10. Clinical outcome of antibiotic prophylaxis has been shown in Table 04.

Table 04: Clinical outcome of antibiotic prophylaxis in patients at Day 10

Clinical outcome	Cephadrine (n=2016)	Cephalexin (n=54)	Amoxicillin (n=149)	Overall (n=2219)
Cured	1657 (82.2)	32 (59.2)	127 (85.2)	1816 (81.8)
Change of dose	211 (10.4)	14 (25.9)	14 (9.4)	239 (10.7)
Change of antibiotic	45 (2.2)	5 (9.2)	5 (3.3)	55 (2.4)
Lost to follow up	103 (5.1)	3 (5.5)	3 (2.0)	109 (4.9)

Any adverse event reported by the patients within 3 days of therapy was recorded by the investigators. 2015 (91%) of the patients reported no adverse event with the prescribed antibiotic prophylaxis.

Diarrhea was the common adverse event reported in 104 (4.7%) patients. Stomach upset other than diarrhea was reported in 68 (3.1%) patients and 31 (1.4%) patients reported dizziness. Reported adverse events were self-limiting, no dose adjustment, discontinuation of therapy or withdrawal from the study was required. No serious adverse events were reported. Adverse events reported in the patients have been shown in Table 05.

Table 05: Adverse events reported in patients with antibiotic prophylaxis

Adverse events	Cephadrine (n=2016)	Cephalexin (n=54)	Amoxicillin (n=149)	Overall (n=2219)
None	1831 (90.8)	52 (96.3)	132 (88.6)	2015 (90.8)
Stomach upset	60 (3.0)	1 (1.9)	7 (4.7)	68 (3.1)
Diarrhea	97 (4.8)	1 (1.9)	6 (4.0)	104 (4.7)
Dizziness	27 (1.3)	0	4 (2.7)	31 (1.4)
Other	1 (0.0)	0	0	1 (0.0)

Discussion

The purpose of this open label non comparative study was to collect, analyse and disseminate data on prophylactic use of cephadrine in dental procedures in Bangladesh. The American Dental Association (ADA), The American Heart Association (AHA) and The American Academy of Orthopaedic Surgeons (AAOS) recommended cephalixin, cephadrine or amoxicillin for prophylactic use in dental procedures where patients have cardiac conditions like prosthetic cardiac valve or prosthetic material used for cardiac valve repair, previous IE, congenital heart diseases (CHD).

A total of 2219 patients were enrolled in this study and had undergone different dental procedures. There were 234 (10.5%) children (<18 years) and 1985 (89.5%) adults with the median age of 35 years (range 5–88 years). Periodontitis, gingivitis, dental caries, gum recession were found common on oral examination. Some of the patients had ulceration or white lesion on tongue, floor of the mouth, palate or gingival mucosa. Root canal therapy, scaling, tooth extraction and dental filling were the most common dental procedures done by the investigators. Other procedures like deep curettage, polishing, root planning and flap, gingivectomy, apicectomy and cyst or any kind of operation were also done in some cases.

Cephadrine (Sefrad®) was prescribed to 2016 (90.9%) patients as antibiotic prophylaxis during their dental procedures with a mean dosage of 500mg (487.48 ± 60.99) and average duration of treatment was 5 days. The investigators also prescribed amoxicillin or cephalixin to some of the patients as prophylaxis. The investigators followed either text book or Key Opinion Leaders' or local guidelines as reference in prescribing prophylactic antibiotic in 318 patients. Generally oral hygiene is not properly maintained in Bangladesh which put the patients at more risk of infection during dental procedures. Therefore, although guidelines do not recommend antibiotic prophylaxis for the patients who are not at the risk but the use of antibiotic is a routine practice in Bangladesh to avoid any chance of infection. However, there is a need of creating more awareness among the dentists about rationale use of antibiotics.

At the end of study an evaluation on Day 10 the majority (82.2%) of the patients having prophylaxis with cephadrine had no clinical sign of infection, only 2.2% of the patients needed to change their antibiotic prescribed initially. In this study safety reports within 3 days were planned to record as most of the related events occur in early days of antibiotic therapy and are self-limiting might be ignored if asked to notice later. Majority (90.8%) of the patients did not report any adverse events. Diarrhea (4.6%) was the common adverse event and mostly reported in children. Some of the patients reported stomach upset (3.1%) other than diarrhea and dizziness (1.4%). The reported adverse events were self-limiting, no dose adjustment, discontinuation of therapy or withdrawal from the study was required. No serious adverse event was also reported.

Conclusion

Although guidelines do not recommend use of antibiotic prophylaxis for the patients undergoing dental procedures who are not at risk but the use of antibiotics were significant in this study as this is a routine practice in Bangladesh. Cephadrine (Sefrad®) 500 mg dosage and a 5 days course was preferred as prophylactic in dental procedures in this study. Majority of the patients had no clinical sign of infection on evaluation at day 10. Cephadrine therapy was mostly not associated with adverse events in patients; however, diarrhea, stomach upset and dizziness were reported in some patients that were self-limiting.

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Management of Dental Health Problem of Diabetic Patients Attending in Selected Private Dental Clinics in Dhaka City

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Abstract

Aim: The rising cases of dental problems among diabetic patients have raised health concerns among dentists worldwide. The oral complications of prime concern are gum disease, dental caries, dry mouth, oral soft tissue damage, and pain in the face and mouth. This descriptive type of cross sectional study was conducted among the diabetic patients for their management of dental problems attending in selected dental clinics in Dhaka city from January to June 2012. 44% of the patients were in between 41 to 50 years age group.

Methods: Data were collected with a pretested semi structured questionnaire and check list was filled in after oral examination.

Results: Among the patients 84% were Muslims and 16% were Hindus. All the patients were married. 58% of the patients had monthly income TK. 25000-40000. Among the patients, 48% had (4-5) family members. Type of family was single for 82% of the patients. Main food was rice for 78% of the patients. 50% of the patients had habit of tobacco use. Tobacco smokers were 88%. Among the patients, calculus and gingivitis was in grade I for 54% and the condition of periodontitis was in grade I for 46%. The condition of oral thrush was in 0 grade for 66% of the patients. Most of the patients' 1 tooth was affected by dental caries. There was no dry mouth in 80% of the patients, whereas no burning mouth syndrome was in 82% of the patients; 64% of the respondents visited dentists. The reason for visiting dentists, most of them visited for sensitivity. All the patients brushed teeth everyday. 66% of the patients brushed teeth once a day. Among the patients 66% cleaned teeth before breakfast and 52% took 3-4 minutes. Among the patients, 90% used tooth brush and 88% used tooth paste for cleaning the teeth. 84% of them did not floss and the rest 62.5% flossed teeth once a day, 62% got information about type of diabetes, among them 62.5% informed about non insulin dependent type of diabetes. Among the patients, 60% got information about usual oral hygiene, 75.9% got information about usual oral hygiene from doctors.

Conclusion: Proper patient management requires close interaction between the dentist and the physician. Working with diabetic patients can be challenging and rewarding when open communications are established and thorough patient education is attained.

Keywords: diabetic patients, dental health problem, management.

Introduction

The rising cases of dental problems among diabetic patients have raised health concerns among dentists worldwide. However, the oral health complications associated with diabetes are often overlooked.

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The oral complications of prime concern are gum (periodontal) disease, dental caries, dry mouth (xerostomia), oral soft tissue damage, and pain in the face and mouth (orofacial pain). In order to diagnose the potential presence of these conditions, it is very important for patients with diabetes to have dental examinations at least every 6 months. In the case of systemic complications from diabetes mellitus (for example, hypertension, cardiovascular disease, retinopathy, renal insufficiency or failure), the dental hygiene practitioners must be prepared to deliver care safely to patients with DM by taking into consideration the pharmacology of diabetes medications and drugs used in dentistry.⁷

Diabetes mellitus (DM) is one of the most frequent pathologies that dentists encounter. Its clinical importance springs from the possible occurrence of acute complications, whose severity could mean an immediate risk for the diabetic patient's life and require urgent diagnosis and treatment. Dental care is very important for patients with diabetes because they face a higher than normal risk of oral health problems due to poorly controlled blood sugars.

Any improvement in glycemic control and/or oral disease has the potential to make a significant impact on the quality of life for individuals with diabetes. The Surgeon General's Report on Oral Health states that good oral health is integral to general health. So be sure to brush and floss properly and see your dentist for regular checkups.⁴

Materials and Methods

Study design: It was a descriptive type of cross sectional study and conducted among diabetic patients attending in selected private dental clinics in Dhaka City.

Duration of the study: The duration of the study was six months from January to June 2012.

Study places: Study places were some selected private dental clinics (Healthy Smile Dental Clinic, Projonmo Dental, Lucky Dental and Dental Solutions) in Dhaka city.

Study population: The population was diabetic patients attending for health care in private dental clinics.

Sample size: 50 diabetic patients were selected for this study.

Sampling technique: Convenient sampling technique was used.

Data collection instruments: In order to collect data a structured questionnaire was prepared considering all objectives and variables of the study. It was then pretested. After making alterations and corrections a final questionnaire was developed.

Data collection technique: The self administered technique was adopted for data collection. The research ethics committee of NIPSOM gave ethical clearance of the study. The data were collected from 22nd April 2012 to 3rd May 2012. Oral examination was carried out by the researcher himself through observation of diabetic patients.

Data analysis: After collection data were cleared, coded and categorized. Data analysis was done by using statistical package for social science (SPSS 16) program. Tables and graphs were made and statistical procedures were applied in analyzing the data where felt necessary.

Results

Table 01: Shows the distribution of patients according to their calculus status. [n=50]

Calculus	Frequency	Percentage
Grade 0	8	16.0
Grade 1	27	54.0
Grade 2	15	30.0
Total	50	100.0

Calculus was in 0 grade for 16% of the patients, grade 1 for 54%, and grade 2 for 30% of the patients.

Table 02: Shows the distribution of patients according to their gingivitis status. [n=50]

Gingivitis	Frequency	Percentage
Grade 0	15	30.0
Grade 1	23	46.0
Grade 2	10	20.0
Grade 3	2	4.0
Total	50	100.0

Gingivitis was in 0 grade for 30% of the patients, grade 1 for 46%, and grade 2 for 20% of the patients.

Table 03: Shows the distribution of patients according to their periodontitis status. [n=50]

Periodontitis	Frequency	Percentage
Grade 0	15	30.0
Grade 1	23	46.0
Grade 2	10	20.0
Grade 3	2	4.0
Total	50	100.0

The condition of periodontitis was in 0 grade for 30% of the patients, grade 1 for 46%, grade 2 for 20%, and grade 3 for 4% of the patients.

Discussion

This simple descriptive type of cross sectional study was conducted among the diabetic patients who smoked are at higher risk up to 20 times more likely than non smokers for the development of thrush and periodontal disease. Smoking also seems to impair blood flow to the gums which may affect wound healing in this tissue area. Among the patients 50% had habit of tobacco use whereas the other 50% had no habit of tobacco use. Tobacco users were smokers for 88% and smokeless tobacco users were 12% of the patients. Cigarette smoking and alcohol consumption have been known to affect the oral micro flora adversely. Smoking is an established risk factor for developing periodontal disease in both healthy people and diabetic patients. Moore et al. reported the prevalence of smoking among diabetics as 19%.¹

Many factors play a role in the loss of teeth in patients with diabetes. First, patients with uncontrolled diabetes are more prone to the development of gingivitis and periodontal disease. If the infection persists, it can spread to the underlying bone that anchors the teeth. Complicating this situation is the fact that infections don't resolve as quickly in patients with diabetes. Among the patients calculus was in 0 grades for 16% of the patients, grade 1 for 54%, and grade 2 for 30% of the patients. Many studies indicated significantly higher mean plaque scores, more calculus and higher gingivitis indices in diabetics than in non-diabetic controls. The results of present study showed no statistically significant differences in the oral hygiene levels between the diabetic and non-diabetic children. However, when splitting the OHIS index into different categories (DI-S and CI-S) it becomes clear that the diabetics had less plaque on their teeth, but significantly more calculus.²

Patients with diabetes who smoked are far more likely to develop gum disease than patients who smoked but did not have diabetes. Poor oral hygiene is a major factor in gum disease for everyone, but it is even more so for a person with diabetes. Gingivitis was in 0 grades for 16% of the patients, grade 1 for 54%, and grade 2 for 30% of the patients.

Thrush is more common in patients with diabetes as high sugar levels lead to better conditions for the yeast to grow. A dry mouth coupled with a higher amount of glucose in the saliva can also make for favourable conditions for thrush. The condition on Oral Thrush/Candidiasis was in 0 grade for 66% of the patients, grade 1 for 30%, and grade 2 for 4% of the patients. 22% of the patients were not affected by dental caries, while 1 tooth was affected in 32%, 2 teeth were

affected in 26%, and more than two teeth were affected in 20% of the patients. There was no Xerostomia/Dry mouth in 80% of the patients; xerostomia/dry mouth was mild in 16% and moderate in 4% of the patients. The diabetic group exhibited significantly higher prevalence of caries and more severe dry mouth, taste change, and mucosa pain than the non diabetic group. The diabetic group tended to have lower predialytic salivary pH, and patients with poor glycemic control (ie, HbA1C > 9%) showed higher proportion of dry mouth, mucosal pain, and tongue coating. However, the DMFT and CPI index were not associated with glycemic control in the diabetic group.^{5,6,8-10}

A study in India shows that only 27.8% of the HD patients brushed their teeth daily and 8.3% said that they never brush their teeth. None of the patients in the study group had a routine dental check-up and all of them reported that they went for a dental visit only when they had a dental problem³. In this study about 90% patients brushes their teeth while average brushing time was 3-4 minutes.

Among the patients who informed about type of diabetes, 37.5% informed about insulin dependent type and 62.5% informed about non insulin dependent type of diabetes. Among the patients, 60% got information about usual oral hygiene and 40% did not get any information.

Conclusion

Patients with diabetes who had oral disease had two chronic conditions, each of which might affect the other, and both of which require frequent professional evaluations, in-depth patient education and consistent educational reinforcement by health care providers. Referral of diabetic patients for routine check-up was not satisfactory; and when patients are referred for dental care, at times their diabetic status was not fully taken into consideration. Fixed features like lower educational status, unemployment, chronic diseases, and longer duration of diabetes show a positive relationship with existence of oral problems; while changeable behavioral factors like smoking, brushing teeth, using tooth paste and powder, visiting dental clinics, acquiring and possessing health knowledge showed an inverse relationship with existence of oral problems.

Proper patient management requires close interaction between the dentist and physician. Working with diabetic patients can be challenging and rewarding when open communications are established and thorough patient education is attained.

Dentists must educate patients and their physicians about the interrelationships between oral health and glycemic control, with an emphasis on the inflammatory nature of oral diseases and the potential systemic effects of oral health infection. This was a simple descriptive type of cross sectional study and the sample size was small, so further study is required to show significant association among the variables.

Recommendations

Considering the findings, the following recommendations are made:

1. Ask individuals with diabetes about their oral health, specifically if they have noticed any signs of infection, bad breath, or a bad taste in their mouth or if they have any other symptoms.
2. Inquire about the last dental and oral health examination.
3. Remind individuals with diabetes that they need periodic dental and periodontal examinations (every 6 months or more frequently).
4. Encourage contact with patients' dental care provider if they notice signs of infection such as sore, swollen, or bleeding gums; loose teeth; mouth ulcers; or pain.
5. Perform an oral examination.
6. Refer all diabetic patients without a dental provider, regardless of oral findings or complaints, to a dentist for preventive care.

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Different Methods of Studying Root Canal Morphology of Human Tooth: A Review

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Abstract

Successful root canal therapy requires an in-depth knowledge of root canal morphology. False assumptions about the root canal anatomy of teeth may lead to misdiagnosis, missed canals, improper debridement and breakage of root canal instruments during root canal treatment. The objective of this paper was to review the various methods used to study and understand root canal systems. The complexity of root canal morphology presents a challenge to any clinician. Any attempt to perform root canal therapy must be preceded with a thorough understanding of the anatomy of both the pulp chamber and the root canal system. Several methods have been used to examine the root canal system ranging from in vitro methods such as sectioning of teeth, metal castings to advanced in vivo tomographic imaging, along with the use of magnification.

Key words: pulp chamber, root canal system.

Introduction

Pulpally involved deciduous and permanent tooth can be preserved by endodontic treatment. The success of root canal therapy is dependent on the clinician's knowledge of root canal morphology, in order to locate all canals and properly clean, shape and obturate the canal space¹⁻³. The root canal morphology of teeth is often extremely complex and highly variable.

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A number of factors contribute to the variation found in the root canal morphology which includes the hard tissue surrounding the pulp and also the ethnic background, age and gender of the population studied.

Work done by many researchers has added understanding of the intricacies of root canals. In 1925, Hess reported wide variations and complexity of root canal systems, and Weine in 1969 provided the first clinical classification of more than one canal system in a single root, by using the mesiobuccal root of the maxillary molars as the model. Vertucci developed a classification system, which was more applicable for laboratory studies.

Several studies have examined the macromorphology of root canals in permanent teeth using different methods of analysis⁴⁻⁶. These range from decalcification and clearing techniques, ground sections of extracted teeth cast from root canals with celluloid and resin, endodontic access with radiograph and instruments, in vitro radiopaque gel infusion and radiography, macroscopic examination and advanced methods such as computed tomographic techniques⁷⁻¹¹.

Aim of the Article

The aim of the article is to review the various methods used to study and understand the complexities of root canal systems.

Different Methods of Study of Root Canal Morphology

There are different ex-vivo and in-vivo methods to study root canal morphology which range from

decalcification and clearing techniques, ground sections of extracted teeth cast from root canals with celluloid and resin, endodontic access with radiograph and instruments, in vitro radiopaque gel infusion and radiography, macroscopic examination and advanced methods such as computed tomographic techniques.

Decalcification and Clearing Technique

The mechanism of this simple and inexpensive technique renders the surrounding hard tissues transparent through demineralisation after placement of dyes into the root canal system. In 1980, Robertson et al described a simple technique for the in vitro examination of endodontically treated or untreated root canal systems. The technique consists of decalcification with nitric acid, dehydration with alcohol, and clearing with methyl salicylate, which renders the teeth transparent¹².

In another method, proposed by Seelig and Gillis¹³ and adapted by Vertucci¹⁴, the dye is injected into the root canals and teeth are cleared, followed by placing in acrylic casting resin. The resultant specimens may be viewed from any direction, rather than merely from the direction they were ground or radiographed. Clearing techniques provide a three dimensional view of the pulp cavity in relation to the exterior tooth surface but it cannot be used in vivo studies.

Sectioning

Sectioning involves longitudinal and cross sectioning of teeth with ultra-thin microtomes with diamond cutting blades, using burs of various sizes and manually grinding with carborundum stones. Weine et. al.¹⁵ sectioned roots of maxillary molars using coarse sand paper disks, thereby exposing the root canal. Greene et. al.¹⁶ vertically sectioned 1300 teeth in order to study their root canal morphology. A high proportion of double canals in single roots was found, especially in the mesiobuccal root of the maxillary molar. With sectioning techniques, the use of burs may alter normal anatomy and the minute curvatures are difficult to follow, regardless of the care exercised in grinding.

Modelling Technique

The modelling technique involves the removal of all surrounding tissues from casts of root canals with woods metal, celluloid or resin^{9,17}. Hess first studied the mesiobuccal root of maxillary molars in vitro by forcing latex rubber into pulp cavities¹⁸. Gomes et al conducted a study to verify if resin models allowed a three dimensional (3D) evaluation of features of pulp

morphology of human permanent mandibular incisors, by obturating the patent pulp space with vinyl resin⁹. Plastic casts have also been created to reproduce the root canal anatomy of human mandibular molars. It is a reliable and reproducible technique that provides sufficient details to allow 3D analysis of root canal morphology but it cannot be used in vivo studies.

Radiopaque Contrast Media

Alacam et. al.¹⁹ evaluated the radiopaque properties of different iodine-containing contrast materials mixed with calcium hydroxide powder. Lateral canals are usually not detected on intraoral radiographs, and in some instances can only be observed after obturation with radiopaque material. Neelakantan et. al.²⁰ compared contrast medium-enhanced digital radiographs with the accuracy of cone beam computed tomography (CBCT), peripheral quantitative computed tomography (pQCT), spiral computed tomography (SCT), plain (plain digi) and contrast medium enhanced digital radiographs (contrast digi), in studying root canal morphology.

They concluded that the CBCT and pQCT were as accurate as the modified canal staining and tooth clearing technique in identifying root canal systems. Clinically, the radiopaque contrast agent is passively injected into the root canal system once sufficient access has been made and appropriate radiographs are taken. With the use of radiopaque contrast medium the images of root canal systems are easier to read and interpret.

Imaging Technique

The discovery of the amazing properties of cathode rays by Professor Wilhelm Konrad Röntgen in 1895, has contributed a great improvement to the dental sciences. Dr. Otto Walkhoff²¹ took the first dental radiographs to aid in diagnosis of hard tissue alteration of teeth, to determine location, shape, size and direction of roots and root canals. Radiographs are helpful in estimating the length of canals and also to locate hard to find or disclose supernumerary root canals by examining the position of an instrument within the canal.

Goldman et. al.²² demonstrated the fallibilities and inherent errors in radiographic interpretation. Radiographs provide a two dimensional view of a three dimensional structure. They are subjected to distortion through improper techniques, anatomic limitations or processing errors.

In addition, the buccolingual dimension is absent on a single film. Several advanced imaging techniques have been developed; some of them related to dental imaging have been discussed here.

Advanced Imaging Techniques

Digital Radiography

In 1970, Mouyen developed radiovisiography. The newer digital systems which rely on electronic detection of an x-ray generated image that is electronically processed and reproduced on a computer screen. Radiovisiography (RVG) is also known as direct digital radiography (DDR). Advantages of this technique include reduced radiation, speed of obtaining the image, enhancement of image, computer storage, transmissibility and a system that does not require chemical processing²³. This technology offers a multitude of options for improving the visual quality of diagnostic images with appropriate enhancement techniques such as magnification, reverse contrast, pseudo-3D embossing. The drawback is high initial investment costs, also competency in using software may take time to master. Issues related to infection control need to be addressed, as the detectors cannot be autoclaved.

Computed Tomography (CT)

The term 'tomography' was first used to describe sectional radiographic techniques. A tomographic image represents a selected 'layer' or 'slice' of the structure, of which images have been recorded²⁴. CT uses x-rays and computers to produce cross sectional slices of the body and has been used in medicine since the early 1970s²⁵. Tachibana and Matsumoto were the first to suggest the use of tomography to study the root canal system in 1990, but as a result of the poor resolution of conventional medical CT scans they were not able to study the root canals in detail²⁶. The advantage of a CT scan is that it allows for 3D reconstruction of root canal systems.

Recently, a new technology known as cone beam computed tomography (CBCT) or digital volume tomography (DVT), which uses an extraoral imaging scanner to produce 3D scans, has become available for dental practice owing to reduced cost and dimensions²⁰. This three-dimensional imaging is capable of capturing both skeletal and soft tissues, which can then be displayed together or separately.

Michetti et. al.²⁷ used CBCT to study the root canal system of human permanent teeth and compared it with histological sections, in order to evaluate root canal systems of mandibular first molars in a Taiwanese population. CBCT is well suited for imaging the craniofacial area. It provides clear images of highly contrast in structures²⁸. Still the availability remains limited because of the significant investment required.

Micro CT /Microtomography/High Resolution Tomography

Micro CT has appeared to be an interesting tool for endodontic research because of its improved resolution, which allows a 3D reconstruction of the internal and external morphology of the tooth²⁹. In this technique data acquisition is non destructive and allows fast examination of morphological characteristics of a tooth in a detailed and accurate manner³⁰. It also has the potential application in preclinical training of students with regard to tooth morphology and endodontic procedures. However, scanning and reconstruction takes considerable time, the equipment is expensive and the technique is not suitable for clinical use.

Spiral Computed Tomography (SCT)

Spiral computed tomography (SCT) has been introduced in endodontics as a diagnostic tool to facilitate access to the internal morphology of soft tissues and hard tissue structures. SCT has been used in the identification of unusual root canal anatomy prior to endodontic therapy. SCT allows faster scanning; thereby decreasing the problem of patient movement during the data acquisition, which has resulted in reduction of problems with image reconstruction and distortion in the final results.

Optical Coherence Tomography (OCT)

Optical coherence tomography (OCT) is a relatively new diagnostic medical imaging technology, which was first introduced in 1991. OCT has evolved into a powerful technique for imaging of transparent and translucent structures. OCT combines the principles of an ultrasound with the imaging performance of a microscope. It creates cross-sectional images of biological structures using differences in the reflection of light. This technique holds promise for full in vivo endodontic imaging³¹. OCT allows placement of an optical fibre into a wet root canal, which is more clinically relevant compared to an endoscope, which requires a dry environment. However, in the current setting, the OCT catheter is expensive. Nonetheless, OCT imaging systems for clinical dental use, are under development.

Tuned Aperture Computed Tomography (TACT)

TACT is a method for achieving three-dimensional information which allows to record images of a desired object and also to isolate a specific area or depth by focusing on information contained within a certain 'slice' thickness. Barton *et al* conducted a study to detect the second root canal in the mesiobuccal root of maxillary first molars using TACT. TACT shows promise as a supplement to film-based dental radiography and as a digital alternative to conventional tomographic systems used in dento-alveolar applications.

Conclusion

The complexity of root canal morphology presents a challenging objective to endodontists. Recent improvements in digital radiographic imaging systems have introduced many potential benefits to endodontic practice. For most dental practitioners, the use of advanced imaging has been limited because of cost and availability. But, the development and rapid commercialisation of technology dedicated to imaging of the maxillofacial region will undoubtedly increase endodontic treatment success by providing more details about canal morphology.

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Androgenetic alopecia (AGA) - New Approach

MA Shafique

Abstract

Androgenetic alopecia is a non-scarring progressive miniaturization of the hair follicle with a usual characteristic pattern distribution in genetically predisposed men¹. It is the most common hair loss disorder which causes significant impairment of life^{2,3}. The frequency and severity of male AGA increases with age in all ethnic groups⁴.

Key words: : alopecia, clinical diagnosis, male androgenic disease updated management.

Introduction

Androgenetic alopecia is an androgen-dependent trait, which leads to progressive miniaturization of the hair follicle in predisposed men. Enhanced androgen effects at the genetically predisposed hair follicles are mediated by raised androgen receptor density and increased activity of 5- α -reductase type II. Thus, AGA is a consequence of the anabolic effect of androgens, such as hormonal changes leading to structural changes in skin and scalp which in turn cause hair loss. However, AGA also requires the presence of the male hormone testosterone. Genetics cause hair follicles to become sensitive to dihydrotestosterone (DHT), a byproduct of testosterone. The follicles begin to grow smaller, have a shorter life span and eventually fall out altogether or leave behind fuzz. Possibly environmental-epigenetic factors apparently play a role in AGA.

Clinical picture

In AGA, hair loss is a well defined pattern, beginning above both temples, and hair thins at the crown of the head. Often a rim of hair is around the sides and rear of head in the left. This pattern is dubbed "Hippocratic balding" and may rarely progress to complete baldness. In males, AGA typically presents with a male pattern distribution including bi-temporal recession and vertex thinning, sometimes anterior recession. About 10 % of men with AGA present a female pattern. It is important to determine if there are other concomitant hair disorders.

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A detailed history should be taken on systemic and newly diagnosed diseases prior to first sign of hair loss. Allergies are not important for the diagnosis of AGA, but they should be recorded for possible significance with regard to therapy. Drug history should be taken, moreover, lifestyle procedures such as special hairstyles should be considered in the history. Researchers reported a dose-dependent effect of moderate to severe AGA in male patients and ultraviolet radiation exposure as an aggravating factor of AGA.

Management

General Considerations

Patients should avoid hair care products likely to damage the scalp or hair and should maintain adequate diet, with adequate protein. If possible, any drug that could affect negatively affect hair growth should be stopped and alternative substitute should be made. Medications for which hair loss is a common potential side effect include retinoids, cytotoxic agents, anticoagulants, captopril, cholesterol lowering drugs, lithium, and valproate. Any underlying scalp disorder should be treated.

Medical Treatments

Patients should be counseled that AGA treatments will not restore hair growth to its pre-pubertal density and that the main aim is to prevent further progression of hair loss. Currently, there are two agents, topical minoxidil and oral finasteride, approved by the US food and drug administration for the treatment of AGA.

Topical Minoxidil Solution

It is administered at a dosage of 1ml twice daily. The main benefit appears to be the prolongation of the anagen phase and hair shaft diameter, irrespective of the underlying cause. It is well established that 5 % of Minoxidil is more effective than the 2 % solution.

Patients should be warned that in the initial 2-8 weeks a temporary telogen effluvium may occur in some, which is self-limiting and subsides when subsequent anagen regrowth begins, and it should not be a cause for treatment cessation.

Oral Finasteride

It is a potent type II 5 α -reductase inhibitor that should be administered at a daily dosage of 1 mg. The number of responding hairs established after 1 year and continued treatment increase the length, diameter and pigmentation of hair so that the coverage of the scalp increased over time. On stopping finasteride, the regrowth hair persisted, but the balding process resumed. Finasteride is generally well tolerated, side effects are typically mild, and generally do not require discontinuation of therapy. Rare side effect may include some loss of libido and erectile function. A recent Japanese study of 3117 patients of AGA shows that long-term use of oral finasteride maintained progressive hair growth without recognized side effects. Another study revealed finasteride 1 mg/day was well tolerated and led to durable improvements in scalp hair growth. In those individuals with no perceptible improvement or stabilization after 1 year of treatment, a combination of medical treatment with hair transplantation is recommended.

Surgical Management

Despite advance in medical therapy, hair transplantation remains the only means of permanent hair restoration in severe AGA. It is contraindicated in patients with hypertension, cardiac diseases and diabetes mellitus.

“Cold X5 Hair Laser In The Treatment Of Male Androgenic Alopecia And Hair Growth”

Both finasteride and minoxidil are effective treatment methods of AGA, but patients who exhibit a poor response to these methods have no additional adequate treatment modalities. In a study researcher reported that after 24 weeks of treatment a low level light therapy named x5 hair laser group showed significantly greater hair density.

Conclusion

Although being an autoimmune disorder, Alopecia Areata is not life-threatening and doesn't cause physical suffering.

But people who are afflicted with this hair loss condition do suffer socially and emotionally, most especially if the hair loss disorder involves their whole body. Alopecia Areata has no known cure or treatment and there are no FDA-approved medications or drugs either. Although, there are several treatments or cures that involve the use of some drugs that proved to be beneficial and helpful in treating hair growth, but for the cure itself in treating Alopecia Areata or preventing new incidents of hair loss is still non-existent.

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Radix Entomolaris in Mandibular First Molar: An Endodontic Challenge

R Goyal¹, J Singh², P Mahajan³, P Monga⁴, D Thaman⁵

Abstract

Success of endodontic therapy depends on the proper identification of all the canals, thorough chemo-mechanical preparation followed by three dimensional obturation with fluid tight seal. Failure of any of these steps may occur due to unusual tooth morphology. Proper knowledge of root canal anatomy is a basic prerequisite for the endodontic treatment successful. Mandibular molars may have an additional root located lingually (radix entomolaris) or buccally (radix paramolaris). Awareness and understanding of the presence of unusual external and internal root canal morphology contributes to the successful outcome of the root canal treatment.

Key words: extra roots, radix entomolaris, variations.

Introduction

A thorough understanding of root canal anatomy and morphology is required for achieving high level of success in endodontic treatment. Inability to recognize variations in root or root canal anatomy can result in failures in endodontic treatment. Hence, it is very important that the clinician be well informed and alerted to the commonest possible variations. Incomplete instrumentation and cleaning of the root canal space and faulty obturation are the main reasons for failure of endodontic treatment.

Root canals are often left untreated because the operator fails to locate them accurately, especially in teeth exhibiting anatomic irregularities or accessory or aberrant root canals^{1,2}.

Anatomical variations are acknowledged characteristics of mandibular permanent molars. Permanent mandibular first molars usually have 2 roots placed mesially and distally and 3 root canals, but variations in the number of roots and in canal morphology are not uncommon. The presence of an extra root in the permanent first molar is the major variant in this group^{2,3}.

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Radix entomolaris (RE), first described by Carabelli, is an anatomical variant found in the permanent mandibular first molar. Radix entomolaris (RE) is characterized by the presence of additional third root (i.e. the supernumerary root or extra distal root), which is typically distributed lingually. This extra distolingual root is generally smaller than the distobuccal root and is usually curved. Radix entomolaris (RE) has not been reported for the mandibular second molar, but it is found (rarely) in the mandibular third molar^{2,3}. Tu et. al. reported that the prevalence of radix entomolaris (RE) in permanent mandibular first molars differs significantly with race^{3,4}.

Endodontic literatures on radix entomolaris (RE) in permanent mandibular first molars reveal its incidence ranging from 0%-43.7%, with the highest prevalence among the Mongolian and Eskimo traits. Based on research data, the prevalence of RE is also found to be high among Taiwanese(Chinese) population and found to be ranging from 21.1% to 33.33%, with a bilateral incidence ranging from 53.65% to 68.57% in them. Further, there was a significantly greater incidence of radix entomolaris (RE) on the right side of the mandible than on the left, but gender did not show a significant relationship with this anatomic variation³⁻⁵.

In spite of high prevalence of radix entomolaris (RE) in certain races, its incidence among the Indian population is found to be very low and only 0.2%³. This case report is about the detection and management of radix entomolaris (RE) in a mandibular first molar during its root canal treatment.

Case Report

A 50-year-old female patient reported with pain in right mandibular first molar i.e. 46, since a week. The pain aggravated on taking cold and hot food items and upon mastication. Her medical history was non contributory. Clinical examination of 46 revealed deep occlusal carious lesion and it was tender to percussion. The periodontal examination of 46 was within the normal limits. Thermal and electric pulp test on 46 showed intense and prolonged response. Intraoral peri-apical radiographic examination of 46 revealed deep caries approximating the pulp space and slight widening of the periodontal ligament space around the apical area of the mesial root.

Apart from this, close inspection of the radiograph also revealed the presence of an additional periodontal ligament space crossing over the distal root leading to an impression of double periodontal ligament space on the distal aspect. This led to the suspicion of additional or extra root entity (Fig. 01). Based on the clinical and radiographic examination, a diagnosis of symptomatic irreversible pulpitis with acute apical periodontitis in 46 was made and the patient was suggested to undergo root canal treatment.

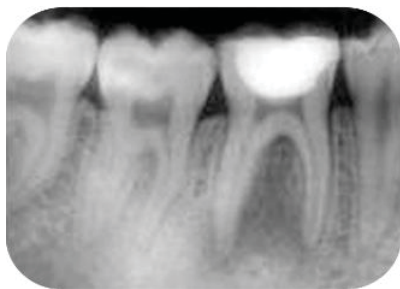


Fig. 01: Preoperative

Root canal treatment in 46 was initiated under rubber dam, following local anesthesia and access opening in it. Careful exploration of the pulp chamber floor and when viewed under operating microscope, revealed four canal orifices (2 mesial & 2 distal), confirming the presence of additional distal canal (Fig. 02). The pulpal tissue remnants were extirpated from the canals using K-file no.10 & no.15 (Dentsply Maillefer, Switzerland).

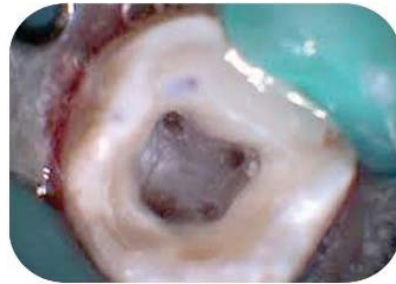


Fig. 02: View under Operating Microscope

Coronal flaring was accomplished with Gates Glidden drills (DentsplyMaillefer, Switzerland). Working length was determined using an apex locator (Root ZX, Morita, Tokyo, Japan). The radiograph taken with a mesial angulation to verify the working length confirmed the presence of extra distolingual root (Fig. 03).

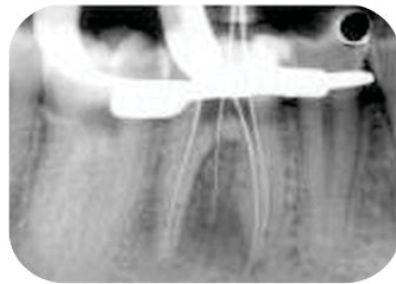


Fig. 03: Working Length

All the canals of 46 were cleaned and shaped upto apical size 30 using step-back technique and irrigated using 3% sodium hypochlorite and 2% chlorhexidine solutions. Calcium-hydroxide (Dentokem, India) was used as an intra-canal medicament and access opening was sealed with Zinc-oxide- eugenol cement (DPI, India). Two weeks later, when the tooth was asymptomatic, the obturation was carried out by selecting gutta-percha (Dentsply Maillefer, Brazil) master cones (Fig. 04), AH Plus sealer (Dentsply De Trey, Konstanz, Germany) and lateral compaction method (Fig. 05).

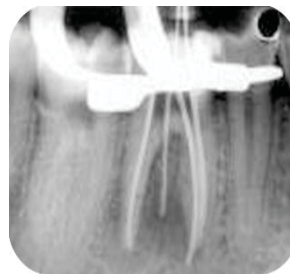


Fig. 04: Master Cone

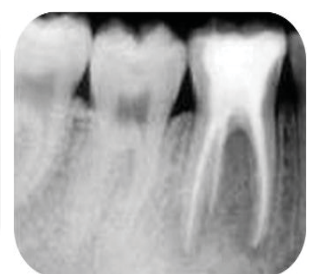


Fig. 05: Postoperative

Discussion

Radix entomolaris (RE), in this patient, characterized by the presence of an additional distolingual root was already detected in the preoperative radiograph. This signifies the importance of preoperative radiograph in the endodontic treatment ^{2,6}. The 3-rooted mandibular first molar reported here had 1 mesial root with 2 canals and 2 distal roots with one canal each. This structure is the same as that of the other 3-rooted mandibular first molars described previously. The roots and canals of mandibular permanent first molars have several typical anatomical features, as well as a great number of anomalies. Studies focusing on canal morphology in mandibular first molar found that the presence of 2 roots (1 mesial & 1 distal) with 3 canals (2 in mesial root and 1 in distal root) is the most common finding.

Nevertheless, the presence of 2 roots (1 mesial & 1 distal) with 4 canals (2 in mesial root and 2 in distal root) is also relatively frequent, particularly with both the distal canals terminating in a single foramen. However, radix entomolaris (RE) characterized by the presence of 2 distal roots, the second one being the extra distolingual root, is not very common as a morphologic variant ¹⁻³.

Calberson et al described 4 types of radix entomolaris (RE), and De Moor et al classified radix entomolaris (RE)s evaluated from extracted teeth into types I–III. Type I: a straight root/root canal; type II: initially curved entrance of the root canal and the continuation as a straight root/root canals; type III: initial curve in the coronal third of the root canal and a second buccally orientated curve starting from the middle third. Radix entomolaris (RE) or extra distolingual root of permanent mandibular first molars is curved buccolingually and typically smaller than the distobuccal root which could be confirmed in this patient during endodontics ^{3,5,7,8}.

It has been reported that RCT in mandibular first molars have a significantly lower success rate than the other teeth. One of the reasons for non healed root canal treatment is persistent infection caused by a missing canal and failure to remove all microorganisms and pulp remnants in the root canal system. Therefore a better awareness of root canal anatomy is essential for improving the healing rate of root canal treatment of mandibular first molars ⁶.

Apart from the awareness about the possible existence and the racial prevalence of radix entomolaris (RE), it can be detected by thorough inspection of pretreatment radiographs, especially those taken from different angles. Intra-oral periapical radiographs may serve as an important aid in identifying radix entomolaris (RE).

It is suggested that the radiographs were successful in over 90% of the cases while identifying additional roots ⁹. Radiographic features like double periodontal ligament images or unclear view of distal root/canal indicate the possibility of radix entomolaris (RE) ⁶. In the present case, all the radiographs taken during the root canal procedure were clearly suggestive of radix entomolaris (RE) and prevented the need for further investigations like cone-beam computed tomography and 3-dimensional reconstruction which are useful to study the morphology of radix entomolaris (RE) in a noninvasive manner ³.

Clinically, the possibilities of detecting and managing radix entomolaris (RE) can be enhanced by obtaining straight line access and modifying typical triangular shape of access preparation to a trapezoidal form. The values based on the mean inter orifice distance between extra distolingual canal and remaining canals, as found in a study by Tu et. al. may also serve as a useful guideline to locate and treat radix entomolaris (RE) ^{3,10}. Further, good illumination and the use of accessories like magnifying loupes, microscopes etc. are also valuable in locating and managing radix entomolaris (RE) ¹¹.

Conclusion

Unlike in other races, radix entomolaris (RE) in mandibular first molar is not a frequent finding in the Indian population. However, Dental clinician should be aware of the occurrence of radix entomolaris (RE) as an anatomical variant. The detection of radix entomolaris (RE) and its thorough cleaning, shaping and obturation would contribute significantly towards the success of primary endodontic treatment. Further, mandibular first molars have lower success rate following root canal treatment due to factors like missed canal etc, and awareness about radix entomolaris (RE) helps in the diagnosis and to better the overall prognosis for endodontic retreatment. For the above reasons, molars also have high rate of extraction and early identification of extra distolingual root will minimize complications related to exodontias like root breakage. This case report also highlights the role of radiographs alone in the early identification and endodontic management of radix entomolaris (RE).

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Synodontia between Permanent Mandibular Central & Lateral Incisors

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Abstract

Dental fusion also called 'synodontia' is a rare dental developmental anomaly in which the union of two independently developing primary or permanent tooth buds occurs. Tooth fusion is defined as union between the dentin and / or enamel of two or more separate developing teeth. The fusion may be partial or total depending upon the stage of tooth development at the time of union. The etiology of fusion is still unclear. The overall prevalence of the tooth fusion is approximately 0.5%. Fusion may be unilateral or bilateral and most often occurs in primary teeth with more predilections for anterior teeth. Clinically fused anterior teeth frequently have a groove or notch on the incisal edge that goes in buccolingual direction and radiographically, the dentin of fused teeth always appears to be joined in some region with separate pulp chambers and canals. Hence the cases of fusion of permanent teeth in different ages are presented.

Key words: : fusion, gemination, supernumerary tooth, tooth anomaly.

Introduction

The anomaly of conjoined teeth has been described under a variety of names. 'Connate' was one of the first introduced terminologies by Tomes (1859). Later De Jome (1955) proposed the term 'Schizodontia' to describe teeth which originate by partial division of dental anlage & 'Synodontia' for those formed by the inability of adjacent tooth germs to retain their individuality. Miles (1954) suggested the term 'Double teeth' which appears to be more appropriate if the etiology is unknown.

Fusion is commonly observed as joining of two teeth of normal series or normal tooth & a supernumerary tooth by pulp & dentin during morpho differentiation of dental germs.

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The prevalence of fusion in permanent dentition is around 0.2%¹ which is rare, as compared to 2.5% in primary dentition. Fusion may be total or partial depending on the stage of odontogenesis & proximity of developing teeth. Found commonly in anterior teeth, this anomaly causes an unpleasant aesthetic tooth shape due to irregular morphology. It generally causes reduced number of teeth in the arch.

Case Report

Case 01: A 37 year old male patient reported to the department of oral medicine diagnosis and radiology with the chief complaint of pain in the left back region of the lower jaw. During oral examination, it was noticed that the patient had mild to moderate generalized periodontitis which was more marked in the mandibular anterior region. The number of teeth present in mandibular arch were less than the normal and one tooth (mandibular incisor of right side) was found to be disproportionately larger with missing mandibular right lateral incisor. The amount of calculi deposits and gingival recession in this region was comparatively greater than the adjacent teeth (Fig. 01).



Fig. 01: Fusion between 41 and 42 with a groove like depression in between which acts as a local plaque retaining.

Intraoral periapical radiographic examination revealed complete fusion of central & lateral incisors with one root & one pulp canal with two pulp horns present in coronal portion. Family history was not contributory (Fig. 02).



Fig. 02: Periapical radiograph showing complete fusion with wide pulp chamber, bifurcation of pulp horn and bone loss secondary to periodontitis.

Case 02: A 18 year old male patient came to the department of oral medicine diagnosis and radiology with the chief complaint of misaligned teeth. During clinical examination, it was noticed that the patient had mild to moderate localized periodontitis in the mandibular anterior region along with anterior overjet and overbite. There was a missing mandibular right lateral incisor replaced by one larger tooth on the same side. Calculi deposits and gingival recession in that region was more compared to other regions (Fig. 03).



Fig. 03: Fusion between 41 and 42 with a groove like depression in between the crown structure.

In Intraoral periapical radiograph we found complete fusion of central & lateral incisors with one root & one pulp canal with two prominent pulp horns (Fig. 04).



Fig. 04: Periapical radiograph showing complete fusion with wide pulp chamber, bifurcation of pulp horn with widening of periodontal ligament space.

Discussion

Fusion may be partial or total depending upon the stage of tooth development at the time of union, a distinguishing feature between fusio-totalis, partialis-coronalis & partialis-radicularis^{2,3}. If the contact occurs before the calcification stage, the teeth unite completely to form one large tooth. Incomplete fusion may be at root level if the contact & union occurs after formation of crown. The etiology of fusion is still an enigma & many different views have been put forward. Some authors believe that fusion results when two tooth germs develop so close together that as they grow, they contact & fuse before calcification⁴. Shafer et al speculated that a physical force or pressure generated during development causes contact of adjacent tooth buds.⁵ Lowell & Soloman believe that fused teeth result from some physical action that causes the young tooth germs to come into contact, thus producing necrosis of the intervening tissues & allowing the enamel organ & dental papilla to fuse together. Many authors have also suggested hereditary involvement as an autosomal dominant trait with reduced penetrance⁶.

Conclusion

In Conclusion the differential diagnosis between fusion & germination is difficult & some authors use the terms as synonyms. Teeth with these abnormalities are unaesthetic & have a higher predisposition to dental caries, periodontal disease & spacing problems (Diastema).

Presence of fissures or grooves extending gingivally in the union between the teeth involved will give rise to periodontal diseases due to accumulation of plaque. Proper case history, clinical & radiographic examinations are mandatory for the correct diagnosis of such abnormalities.

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Accidentally Broken Lateral Incisor Tooth at the Gingival Margin Treated by Endodontics, Cast Post and Core Finally Porcelain Jacket Crown: A Case Report

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Abstract

A successful treatment of a badly broken tooth in accidental case depends not only on good endodontic therapy but also on good prosthetic reconstruction of the tooth after the endodontic treatment is complete. In accidental case, sometimes it is found that there is very little or no clinical crown after root canal treatment. In such cases, additional retention & support of the restoration are difficult to achieve. In this case report endodontically treated tooth by using cast post is discussed to achieve additional retention and support.

Keywords: cast post, core, endodontics, retention.

Introduction

The goal of modern dentistry is to restore the natural teeth with their maximal function and aesthetics^{1,2}. Generally a successful treatment of a badly broken tooth in accidental case depends not only on good endodontic therapy, but also on good prosthetic reconstruction of the tooth after the endodontic therapy is complete³. The basic purpose of a cast post is to retain a core in a tooth that lost its coronal structure extensively. This case report describes the procedure to restore function and aesthetics of maxillary left lateral incisor with severe coronal destruction⁴. The crown lengthening procedure was done after endodontic treatment by using cast post fitted with glass-ionomer cement which was later came to an end by using metal ceramic restoration⁵.

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Case report

A 24 year male patient reported in my private clinic with a history of trauma to upper left lateral incisor. On examination it was found that there was fracture of upper left lateral incisor with extensive loss of crown portion involving pulp tissue. His chief complaint was pain and non aesthesis of the tooth, with no history of mobility or discharging sinus.

An intra oral periapical X-ray was taken, which revealed no periapical radiolucency and intact sound root portion. Medical and dental history also confirmed that he is free from any systemic disease.

Procedure

Under L.A. (Local Anesthetics) the pulp tissue was removed and the canal was irrigated with normal saline. A working length radiograph was taken and working length was estimated. Finally the obturation of the root canal has been done properly. During the next visit, both hand instrument and rotary safe ended post space preparation drills were used to remove condensed gutta-percha until the desired post space depth was achieved leaving the apical 4mm to maintain the hermetic seal. Copious irrigation was done not only to remove the obturation material but also to avoid any damage because of the heat production. The remaining coronal part was prepared by incorporating a ferrule design to encircle the external dimension of the residual tooth. A cast post was fabricated indirectly on a cast, which was obtained from an impression using silicon impression material. Finally the cast post and core were subsequently cemented and the preparation was completed for a full down coverage.



Figure 01: Accidentally broken left lateral incisor.



Figure 02: Tooth preparation and cast core fitted.



Figure 03: Finally tooth covered with acrylic jacket crown.

Discussion

The goal of modern dentistry is to restore satisfactory form, function and aesthetics as well as maintaining the physiologic integrity of the tooth with the adjacent hard and soft tissues.

In achieving the above specific restoration was accomplished by enhancing the retention and resistance form of the tooth by making a cast post and core, which ultimately provided the appropriate support for the specific crown or prosthesis.

Various occlusal and non-axial forces are acting upon anterior as well as posterior teeth. The teeth and associated restoration must resiliently absorb these forces to avoid the permanent damage like wear or fracture. In case of deep vertical overlap, maxillary anterior teeth are subjected to horizontal protrusive and lateral forces from the mandibular anterior teeth.

After the crown preparation of an endodontically treated tooth, the remaining amount of cross sectional sound dentine is not able to resist such forces, that's why a post and core build up becomes compulsory in such cases.

Conclusion

Conservation, proper functioning and aesthetics should be the final destination of a restoration dentist which can be achieved by appropriately restoring the fractured tooth by means of custom cast post and core restoration and providing the patient with satisfactory function and aesthetics.

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